



United States  
Environmental Protection Agency

Air and Radiation  
Stratospheric Protection Division  
6205J

## Substitute Refrigerants Under SNAP as of October 16, 1996

**SNAP Information: <http://www.epa.gov/ozone/title6/snap/>**  
**Stratospheric Ozone Protection Hotline: (800) 296-1996**

EPA has created the Significant New Alternatives Policy (SNAP) Program under section 612 of the Clean Air Act Amendments. SNAP evaluates alternatives to ozone-depleting substances. Substitutes are reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential as described in the final SNAP rule (59 FR 13044). List of acceptable and unacceptable substitutes will be updated quarterly in the Federal Register. The following SNAP notices and subsequent final rules are included in this list: August 26, 1994 (59 FR 44240), January 13, 1995 (60 FR 3318), June 13, 1995 (60 FR 31092), July 28, 1995 (60 FR 38729), February 8, 1995 (61 FR 4736), May 22, 1996 (61 FR 25585), September 5, 1996 (61 FR 47012), and October 16, 1996 (61 FR 54029).

### Acceptable Substitutes for Air Conditioning under the Significant New Alternatives Policy (SNAP) Program as of October 16, 1996

Substitutes (Name Used in the Federal Register)	Trade Name	CFC-11 Centrifugal Chillers	CFC-12, CFC-114, R-500 Centrifugal Chillers	CFC-12, R-500 Recipro- cating Chillers	CFC-12 Motor Vehicle AC	Non-Automotive Motor Vehicle AC	CFC-114 Industrial Process AC	CFC-12, R-500 Residential Dehumid- ifiers
HCFC-123	123	R, N	N					
HCFC-22	22	N	N	N		R, N*	N (only <115F)	R, N
HCFC-124	124		R, N (CFC-114 only)				R, N	
HFC-134a	134a	N	R, N	R, N	R, N*		N (only <125F)	R, N
HFC-227ea		N	N	N				
HFC-236fa			R, N (CFC-114 only)					
R-401A, R-401B	MP-39, MP-66			R, N			R, N	R, N
R-401C	MP-52					R, N		

Key: R = Retrofit Uses, N = New Uses

**Acceptable Substitutes for Air Conditioning under the  
Significant New Alternatives Policy (SNAP) Program as of October 16, 1996, 1996 (continued)**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>CFC-11 Centrifugal Chillers</b>	<b>CFC-12, CFC-114, R-500 Centrifugal Chillers</b>	<b>CFC-12, R-500 Recipro- cating Chillers</b>	<b>CFC-12 Motor Vehicle AC</b>	<b>Non-Automotive Motor Vehicle AC</b>	<b>CFC-114 Industrial Process AC</b>	<b>CFC-12, R-500 Residential Dehumidifiers</b>
<b>R-406A</b>	GHG		R, N (R-500 only)		R, N**			R
<b>R-409A (HCFC Blend Gamma)</b>	409A			R, N				R
<b>R-411A, R-411B</b>	411A, 411B			R, N				
<b>FRIGC (HCFC Blend Beta)</b>	FRIGC FR-12			R, N	R, N*			R, N
<b>Free Zone (HCFC Blend Delta)</b>	Freezone / RB-276		R, N (CFC-12, R-500 only)	R, N	R, N*	R, N		R, N
<b>Blend Zeta</b>	Ikon				R, N*			
<b>Hot Shot</b>	Hot Shot, Kar Kool		R, N (CFC-12, R-500 only)	R, N	R, N**	R, N		R, N
<b>GHG-X4</b>	GHG-X4, Autofrost, Chill-it		R, N (CFC-12, R-500 only)	R, N	R, N**	R, N		R, N
<b>Freeze 12</b>	Freeze 12		R, N (CFC-12, R-500 only)	R, N	R, N*	R, N		R, N
<b>GHG-HP (HCFC Blend Lambda)</b>	GHG-HP				R, N**			R, N
<b>G2018C</b>	G2018C		R, N (CFC-12, R-500 only)	R, N				
<b>Ammonia Vapor Compression</b>		N	N					
<b>Evaporative Cooling</b>		N	N	N		N		
<b>Desiccant Cooling</b>		N	N	N				
<b>Ammonia / Water Absorption</b>		N	N					
<b>Water / Lithium Bromide Absorption</b>		N	N					

Key: R = Retrofit Uses, N = New Uses

\*These refrigerants are actually "acceptable subject to use conditions." The conditions include 1)the use of unique fittings, 2)the use of descriptive labels, and 3) a prohibition against topping off one refrigerant with another. Details may be found in EPA's fact sheet titled "Choosing and Using Alternative Refrigerants for Motor Vehicle Air Conditioning."

\*\* In addition to the use conditions listed under (\*), these refrigerants must be used with barrier hoses.

**Acceptable Substitutes for Commercial Refrigeration under the  
Significant New Alternatives Policy (SNAP) Program as of October 16, 1996**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>ODS Being Replaced</b>	<b>Cold Storage Ware- houses</b>	<b>Ref. Transport</b>	<b>Retail Food Ref.</b>	<b>Ice Machines</b>	<b>Vending Machines</b>	<b>Water Coolers</b>	<b>Non-Mech- anical Heat Transfer</b>	<b>Very Low Temp. Ref.</b>
<b>HCFC-22</b>	22	12, 502	R, N	R, N	R, N	N	R, N	N		
<b>HFC-134a</b>	134a	12	R, N	R, N	R, N	N	R, N	R, N		
<b>HFC-227ea</b>		12	N		N					
<b>R-401A, R-401B</b>	MP39, MP66	12	R, N	R, N	R, N	R, N	R, N	R, N		
<b>R-402A, R-402B</b>	HP80, HP81	502	R, N	R, N	R, N	R, N				
<b>R-404A</b>	HP62, 404A	502	R, N	R, N	R, N	R, N	R, N			
<b>R-406A</b>	GHG	12, 500	R	R	R	R	R	R		
<b>R-407A, R-407B</b>	Klea 407A, 407B	502	R, N	R, N	R, N	R, N				
<b>R-408A (HCFC Blend Epsilon)</b>	408A	502	R	R	R	R				
<b>R-409A (HCFC Blend Gamma)</b>	409A	12		R	R	R	R	R		
<b>R-411A, R-411B</b>	411A, 411B	12, 502	R, N	R, N	R, N	R, N	R, N	R, N		
<b>R-507</b>	AZ-50	502	R, N	R, N	R, N	R, N	R, N			
<b>R-508 (PFC Blend Alpha)</b>	Klea 5R3	13, 13B1, 503								R, N
<b>FRIGC (HCFC Blend Beta)</b>	FRIGC FR-12	12	R, N	R, N	R, N	R, N	R, N	R, N		
<b>Free Zone (HCFC Blend Delta)</b>	Free Zone / RB-276	12	R, N	R, N	R, N	R, N	R, N	R, N		
<b>Hot Shot</b>	Hot Shot	12, 500	R, N	R, N	R, N	R, N	R, N	R, N		
<b>GHG-X4</b>	GHG-X4	12, 500	R, N	R, N	R, N	R, N	R, N	R, N		
<b>FREEZE 12</b>	FREEZE 12	12	R, N	R, N	R, N	R, N	R, N	R, N		
<b>G2018C</b>	G2018C	12, 500, 502	R, N	R, N	R, N	R, N	R, N	R, N		
<b>(HCFC Blend Lambda)</b>	GHG-HP	12	R, N	R, N	R, N	R, N	R, N	R, N		
<b>Ammonia Vapor Compression</b>		all	N		N	N				
<b>Evaporative/Desiccant Cooling</b>		all	N							
<b>Stirling Cycle</b>		all		N						

**Acceptable Substitutes for Commercial Refrigeration under the  
Significant New Alternatives Policy (SNAP) Program as of October 16, 1996 (continued)**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>ODS Being Replaced</b>	<b>Cold Storage Ware- houses</b>	<b>Ref. Transport</b>	<b>Retail Food Ref.</b>	<b>Ice Machines</b>	<b>Vending Machines</b>	<b>Water Coolers</b>	<b>Non-Mecha- nical Heat Transfer</b>	<b>Very Low Temp. Ref.</b>
Direct Nitrogen Expansion		all		N						
Pressure Stepdown		all		N						
CO <sub>2</sub>		11, 12, 13, 113, 114, 115, 13B1, 503							R, N	R, N
Volatile Methyl Siloxanes, Water, Mineral Oil		11, 12, 113, 114, 115							R, N	
C <sub>3</sub> F <sub>8</sub> , C <sub>4</sub> F <sub>10</sub> , C <sub>5</sub> F <sub>12</sub> , C <sub>5</sub> F <sub>11</sub> NO, C <sub>6</sub> F <sub>14</sub> , , C <sub>6</sub> F <sub>13</sub> NO, C <sub>7</sub> F <sub>16</sub> , C <sub>7</sub> F <sub>15</sub> NO, C <sub>8</sub> F <sub>18</sub> , C <sub>8</sub> F <sub>16</sub> O, and C <sub>9</sub> F <sub>21</sub> N									R, N*	
NARM-502		13,13B1,503								R, N

Key: R = Retrofit Uses, N = New Uses

\*Acceptable only where no other alternatives are technically feasible due to safety or performance requirements.

**Acceptable Substitutes for Non-Commercial Refrigeration under the  
Significant New Alternatives Policy (SNAP) Program as of October 16, 1996, 1996**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>ODS Being Replaced</b>	<b>Industrial Process Refrigeration</b>	<b>Ice Skating Rinks</b>	<b>Household Refrigerators</b>	<b>Household Freezers</b>
HCFC-123	123	11	R, N			
HCFC-22	22	12, 502	R, N	R, N	R, N	R, N
HFC-23		13, 13B1, 503	R, N			
HFC-134a	134a	12	R, N		R, N	R, N
HFC-152a		12			N	N
HFC-227ea		12	N			
R-401A, R-401B	MP-39, MP-66	12	R, N	R	R, N	R, N
R-402A, R-402B	HP-80, HP-81	502	R, N			R, N
R-403B	Isceon 69-L	13, 13B1, 503	R, N*			
R-404A	HP-62, 404A	502	R, N			R, N
R-406A	GHG	12, 500	R		R	R
R-407A, R-407B	Klea 407A, 407B	502	R, N	R, N		
R-408A (HCFC Blend Epsilon)	408A	502	R			
R-409A (HCFC Blend Gamma)	409A	12			R	R
R-411A, R-411B	411A, 411B	12, 502	R, N			
R-507	AZ-50	502	R, N			
R-508 (PFC Blend Alpha)		13, 13B1, 503	R, N			
FRIGC (HCFC Blend Beta)	FRIGC FR-12	12	R, N		R, N	R, N
Free Zone (HCFC Blend Delta)	Free Zone / RB-276	12	R, N	R, N	R, N	R, N
Hot Shot	Hot Shot	12, 500	R, N	R, N	R, N	R, N
GHG-X4	GHG-X4	12, 500	R, N	R, N	R, N	R, N
FREEZE 12	FREEZE 12	12	R, N	R, N	R, N	R, N
G2018C	G2018C	12, 500, 502	R, N	R, N		
(HCFC Blend Lambda)	GHG-HP	12	R, N		R, N	R, N
NARM-502	NARM-502	13, 503	R, N			

**Acceptable Substitutes for Non-Commercial Refrigeration under the  
Significant New Alternatives Policy (SNAP) Program as of October 16, 1996 (continued)**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>ODS Being Replaced</b>	<b>Industrial Process Refrigeration</b>	<b>Ice Skating Rinks</b>	<b>Household Refrigerators</b>	<b>Household Freezers</b>
CO2		13, 13B1, 503	R, N			
Ammonia Vapor Compression		12, 502	R, N	R, N		
Ammonia Absorption		12			N	N
Propane, Propylene, Butane, HC Blend A, B	HC-12a, OZ-12	all	R, N*			
Chlorine		all	R, N			
Evaporative/Desiccant Cooling		all	N			

Key: R = Retrofit Uses, N = New Uses

\*Prohibited for other end-uses. See the list of unacceptable refrigerants below.

**Unacceptable Substitute Refrigerants**

**Significant New Alternatives Policy (SNAP) Program as of October 16, 1996, 1996**

<b>Substitutes (Name Used in the Federal Register)</b>	<b>Trade Name</b>	<b>ODS Being Replaced</b>	<b>End-Uses</b>	<b>Reason</b>
All flammable refrigerants, including OZ-12 (Hydrocarbon Blend A) and HC-12a (Hydrocarbon Blend B)		CFC-12	Motor Vehicle Air Conditioning, retrofit and new	lack of adequate risk assessment that characterizes incremental flammability risk
OZ-12 (Hydrocarbon Blend A) and HC-12a (Hydrocarbon Blend B)	OZ-12, HC-12a	CFC-12	All End-uses other than Industrial Process Refrigeration, retrofit and new	lack of adequate risk assessment that characterizes incremental flammability risk
R-176*		CFC-12	All End-Uses, retrofit and new	contains CFC-12
R-403B		R-502	All End-Uses, retrofit and new	contains a perfluorocarbon that exhibits extremely high GWP and very long lifetime
R-405A		CFC-12	All End-Uses, retrofit and new	contains a perfluorocarbon that exhibits extremely high GWP and very long lifetime

\*R-176 contains CFC-12, HCFC-22, and HCFC-142b. It is a different product from RB-276, typically sold under the name "Freezone."

## Alternative Refrigerant Manufacturers

Refrigerant	Allied Signal	Dupont	Elf Atochem	ICI	People's Welding Supply	Green-cool	Refrigerant Gases	IKON	Inter-magnetics General	ICOR	Technical Chemical
	800-522-8001	800-235-7882	800-343-7940	800-275-5532	800-382-9006	703-643-2376	888-373-3066	505-345-2707	800-555-1442	800-357-4062	800-527-0885
HCFC-123	Genetron 123	Suva 123	Forane 123								
HCFC-22	Genetron 22	Freon 22	Forane 22	Arcton-22							
HFC-134a	Genetron 134a	Suva 134a	Forane 134a	Klea 134a							
HCFC-124	Genetron 124	HCFC-124	Forane 124								
R-401A, R-401B	MP39, MP66	Suva MP39, MP66	Forane 401A, 401B								
R-402A, R-402B	HP80, HP81	Suva HP80, HP81	Forane 402A, 402B								
R-404A	Genetron 404A	Suva HP62	Forane 404A								
R-406A					GHG						
R407A, R-407B				Klea 407A, 407B							
R-408A	Genetron-408A		Forane 408A								
R-409A	Genetron-409A		Forane 409A								
R-411A, R-411B	AZ-50					R-411A, B					
R-507											
R-508				Klea 5R3							
HCFC Blend Beta									FRIGC FR-12		
HCFC Blend Delta							Free Zone / RB-276				
GHG-X4					Autofrost / Chill-It						
GHG-HP					GHG-HP						
Hot Shot										Hot Shot	
Blend Zeta								IKON-12			
Freeze 12											Freeze 12
G2018C						G2018C					